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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/617,859	07/14/2003	Hartmut Hibst	53725	3805
26474	7590	08/11/2005	EXAMINER	
NOVAK DRUCE DELUCA & QUIGG, LLP 1300 EYE STREET NW SUITE 400 EAST WASHINGTON, DC 20005			WITHERSPOON, SIKARL A	
			ART UNIT	PAPER NUMBER
			1621	

DATE MAILED: 08/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/617,859

Applicant(s)

HIBST ET AL.

Examiner

Sikarl A. Witherspoon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10/29/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

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## **DETAILED ACTION**

### ***Election/Restrictions***

The examiner has withdrawn the restriction requirement made on June 15, 2004, and has examined all of the instant claims together. Applicants' election and traversal of the restriction requirement, on July 19, 2004 has been rendered moot.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Popova et al (Kinetics and Catalysis, 1965), Monnier et al (US 4,942,263) and Srednev et al (Russ. J. Org. Chem. 1998).

The instant claims are drawn to a structured catalyst bed comprising at least one catalytically active part bed comprising silver, and alkali metal and a porous support material, and, at least one catalytically active part bed comprising an alkali metal phosphate and at least one sheet silicate. Further limitations include the structured catalyst bed further comprising a catalytically active part bed comprising at least a mixture of oxides of the main group metals and transition metals.

Popova et al teach oxidation of n-butenes using a copper oxide catalyst; a butadiene radical if formed as a result of the reaction (p 859, top of page). Monnier et al

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teach a process for making aldehydes; for example, crotonaldehyde is made by oxidizing 1,3-butadiene in the presence of a catalyst bed comprising silver dispersed on alumina, and at least on promoter selected from salts of alkali metals, alkaline earth metals, etc. (abstract; col. 5, lines 20-30). Srednev et al teach the rearrangement of 3,4-epoxy-1-butene (vinylloxirane) over lithium phosphate.

The three references discussed above teach individual process steps that ultimately result in the formation of crotonaldehyde. The examiner takes the position that it would have been obvious to a person of ordinary skill in the art; therefore, to combine the catalysts taught in the individual references into one catalyst bed, or rather a series of catalyst bed, to be used in a single reactor, i.e., in a fixed bed. A person of ordinary skill would have been motivated to do so by the desire to conduct a more cost efficient process, i.e., one using less equipment, since each of the individual reactions, catalyzed by the respective catalysts, could be conducted in a single reactor, from one catalyst bed to another. The arrangement of the catalytically active beds would be obvious to a person of ordinary skill, since such a person would know how to arrange the beds so as to afford optimal production of the desired product. It also would have been obvious to a person of ordinary skill to include any number of non-catalytically active beds, and/or intermediate spaces, in order to separate reaction effluents that may have adverse effects on the reaction(s) being catalyzed in subsequent beds.

Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Popova et al (Kinetics and Catalysis, 1965), Monnier et al (US 4,942,263) and Srednev et al (Russ. J.Org.Chem. 1998).

The instant claims are drawn to a process for preparing crotonaldehyde from C4-monoolefins or diolefins using the structured catalyst bed of the present invention.

Popova et al teach oxidation of n-butenes using a copper oxide catalyst; a butadiene radical is formed as a result of the reaction (p 859, top of page). Monnier et al teach a process for making aldehydes; for example, crotonaldehyde is made by oxidizing 1,3-butadiene in the presence of a catalyst bed comprising silver dispersed on alumina, and at least on promoter selected from salts of alkali metals, alkaline earth metals, etc. (abstract; col. 5, lines 20-30). Srednev et al teach the rearrangement of 3,4-epoxy-1-butene (vinylloxirane) over lithium phosphate.

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***Claim Objections***

Claim 5 is objected to because of the following informalities: in line 4 of the claim, the phrase, "in any permutation and repetition" is repeated. Appropriate correction is required.

Claim 7 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The instant claim describes the catalytically active bed part (III) in the same way as it is described in claim 1.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sikarl A. Witherspoon whose telephone number is 571-272-0649. The examiner can normally be reached on M-F 8:30-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann Richter can be reached on 571-272-0646. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S.A.W.

*Sikarl A. Witherspoon*  
**SIKARL A. WITHERSPOON**  
**PATENT EXAMINER**